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ABSTRACT

This annotated bibliography suggests to teachers and librarians books that may serve to enrich the instructional program by providing sources of information and recreational reading. Sections are provided for primary, intermediate, and junior high school students. Most of the books suggested for primary children are those from the general literature that give special attention to mathematical ideas. Books listed in the sections for intermediate and junior high school students are largely devoted to science and mathematics and related topics. (RP)

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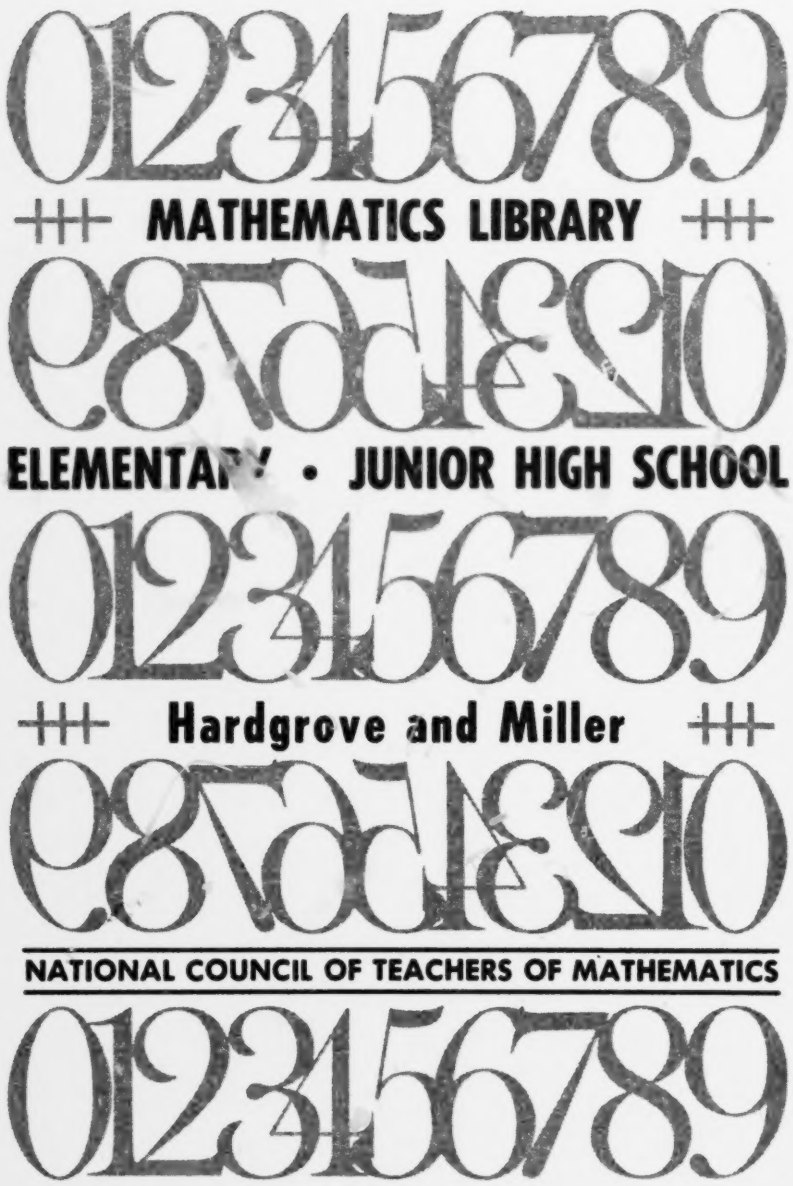
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ELEMENTARY and JUNIOR HIGH SCHOOL

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Foreword

Growth in the ability to think with the ideas of mathematics requires a wide variety of experiences. Reading, one of the most rewarding of these experiences, helps with the understanding of ideas and also stimulates further interest and activity on the part of the learner. Books in a school library may enrich the mathematics program by providing such a stimulus for students.

This bibliography suggests to teachers and librarians books that may serve to enrich the instructional program by providing sources of information and recreational reading. It consists of sections for primary, intermediate, and junior high school students. Most of the books suggested for primary children are those from the general literature that give special attention to mathematical ideas. Books listed in the sections for intermediate and junior high school students are largely devoted to science and mathematics and related topics.

The grade-placement suggestions are simply recommendations; teachers may want to make adaptations to fit the needs of their own classes. In some cases a book covers a great enough range to be useful in both primary and intermediate grades or intermediate and junior high school grades. When a book is listed twice, the reader is referred in the second listing to the page of initial listing for publication data and annotation.

The present pamphlet is an outgrowth and an updating of the following bibliographies:

HUTCHESON, RUTH; MANTOR, EDNA; and HOLMBERG, MARJORIE B. "The Elementary School Mathematics Library: A Selected Bibliography," *The Arithmetic Teacher,* III (February 1956), 8-16.

HESS, ADRIEN L. "A Bibliography of Mathematics Books for Elementary School Libraries," *The Arithmetic Teacher,* IV (February 1957), 15-20.

HESS, ADRIEN L. "Bibliography of Books for Enrichment in Arithmetic," *The Arithmetic Teacher,* VI (February 1959), 12-16.

HARDGROVE, CLARENCE ETHEL; COLE, MILDRED; and GUSTAFSON, ANNE. *Thinking in the Language of Mathematics*. Bulletin No. C-2. Springfield, Ill.: Illinois Curriculum Program, 1959. Pp. 121-26.

HARDGROVE, CLARENCE ETHEL. *The Elementary and Junior High School Mathematics Library*. Washington, D.C.: The National Council of Teachers of Mathematics, 1960.

C. E. H.
H. F. M.

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Note to the Reader

For references to more advanced materials, see the companion bibliography, *The High School Mathematics Library* (third edition, 1968).

Primary Grades

BAER, HOWARD. *Now This, Now That*. Holiday, 1957, unpaged, $2.25. Grades 1-3.

Encourages children to look at things from different distances and different angles as they develop such comparative vocabulary as *big, little, up, down, taller, straight, under, on, far,* and *near*.

BAKER, MARYBOB. *The Smiley Lion Book*. Illustrated by J. P. Miller. Golden, 1964, unpaged, $1.69. Grades K-1.

A counting book that uses names and numerals for the numbers one through ten.

BARR, CATHRINE. *Seven Chicks Missing*. Walck, 1962, 32 pp., $2.75. Grades K-2.

Simple easy-to-read text and pictures that use ideas of seven through one.

BARR, DONALD. *Arithmetic for Billy Goats*. Illustrated by Don Madden. Harcourt, 1966, 108 pp., $3.50. Grades 3-6.

A fantasy of how arithmetic with base-two numerals might have been invented.

BEHN, HARRY. *All Kinds of Time*. Harcourt, 1950, unpaged, $3.00. Grades 1-4.

A poetic and fanciful picture book about clocks, time, and the seasons.

BEIM, JERROLD. *The Smallest Boy in the Class*. Morrow, 1949, 47 pp., $2.94. Grades 1-3.

The antics of the smallest boy in the class, used to develop the ideas of comparison such as big, biggest, small, smallest, tiny, tall, and tallest.

BENDICK, JEANNE. *All Around You*. McGraw, 1951, 48 pp., $3.50. Grades K-4.

Describes in simple pictures and with the vocabulary of comparison, number, and measurement the why and how of the world about us. Among the many topics considered are shadows, clouds, fog and rain, the year, soil, seeds, and insects.

BERKLEY, ETHEL S. *Ups and Downs: A First Book About Space*. Illustrated by Kathleen Elgin. Hale, 1951, unpaged, $1.83. Grades 1-2.

Pictures and text help develop concepts of up, down, high, low, bottom, top, under, and over.

BIANCO, PAMELA. *The Doll in the Window*. Walck, 1953, 32 pp., $3.25. Grades 1-2.

A little girl who saved her pennies to buy Christmas presents for her five sisters uses ideas of value and comparison in planning her purchases.

BISHOP, CLAIRE HUCHET. *Twenty-Two Bears*. Illustrated by Kurt Wiese. Viking, 1964, 31 pp., $2.75. Grades K-2.

Uses each of the numbers one through twenty-two in the story of a dream about bears.

BISHOP, CLAIRE HUCHET, and WIESE, KURT. *The Five Chinese Brothers*. Coward, 1938, 44 pp., $2.50. Grades 1-3.

The ordinal-number ideas one through five developed.

BLAIR, MARY. *The Up and Down Book*. Golden, 1964, unpaged, $1.00. Grades K-1.

A picture book that contrasts "up" and "down."

BLOUGH, GLENN O. *Wait for the Sunshine*. Illustrated by Jeanne Bendick. McGraw, 1954, 47 pp., $3.25. Grades 1-4.

This story of seasons and growing things utilizes many ideas of measurement and comparison as well as number ideas.

BRANLEY, FRANKLYN M. *Big Tracks, Little Tracks*. Illustrated by Leonard Kessler. Crowell, 1960, unpaged, $3.25. Grades 1-2.

Cleverly illustrated book about the tracks made by people, their household pets, and other animals. Relates size of the tracks to the size of their makers.

———. *North, South, East, and West*. Illustrated by Robert Galster. Crowell, 1966, unpaged, $3.25. Grades 2-4.

Easy text develops language of position in an effective way.

CHALMERS, AUDREY. *Hundreds and Hundreds of Pancakes*. Viking, 1941, 38 pp., $2.25. Grades K-2.

The concept of hundreds as many is developed as a family of six deals with hundreds of pancakes. Also conveyed are ideas of size, position, comparison, and measurement.

CORCOS, LUCILLE. *Joel Spends His Money*. Abelard, 1954, 40 pp., $2.75. Grades 2-3.

The value of money and ideas of saving and spending illustrated as Joel learns how best to use his allowance.

D'AULAIRE, INGRI, and D'AULAIRE, EDGAR PARIN. *Don't Count Your Chicks*. Doubleday, 1943, 40 pp., $3.50. Grades K-3.

An old lady counts eggs and money and makes use of the one-to-one correspondence idea while she dreams of more chickens, more eggs, and more money.

DUVOISIN, ROGER ANTOINE. *Two Lonely Ducks*. Knopf, 1955, 36 pp., $2.89. Grades K-1.

Cardinal and ordinal numbers in word and symbol appear many times in this story of two ducks and their ten ducklings.

EDITORS OF DOUBLEDAY. *One, Two, Buckle My Shoe*. Illustrated by Gail Haley. Doubleday, 1964, 63 pp., $3.25. Grades K-1.

A collection of modern and ancient counting rhymes. Cleverly illustrated.

ELKIN, BENJAMIN. *Six Foolish Fishermen*. Illustrated by Katherine Evans. Childrens, 1957, unpaged, $2.50. Grades K-3.

Cardinal and ordinal numbers from one through six are employed in telling about six brothers who went fishing. Each fisherman tries to find his sixth brother.

EMBERLY, ED. *The Wing on a Flea—a Book About Shapes*. Illustrated by the author. Little, 1961, 48 pp., $3.25. Grades K-2.

A beautifully illustrated story about objects that show triangular, rectangular, and circular shapes.

FEDERICO, HELEN. *The Golden Happy Book of Numbers*. Golden, 1963, unpaged, $2.19. Grades K-1.

Many sets of objects illustrate the use of the numbers one through ten.

FEHR, HOWARD F. *Five Is 5*. See "Little Owl Books," p. 8. Grades K-2.

Introduces many different pictures of sets of five members and numerals for five.

———. *If You Can Count to Ten*. See "Young Owl Books," p. 15. Grades 2-4.

Attractive pictures of objects described with numbers.

———. *This Is My Family*. See "Little Owl Books," p. 8. Grades K-2.

Pictures and description of a family and some of its subsets.

FISHER, MARGERY M. *One and One*. Illustrated by Leonard Everett Fisher. Dial, 1963, unpaged, $2.50. Grades K-2.

Pictures and text designed to help children learn to count to ten and to learn the addition facts with sums of ten or less.

FORD, HENRY W. *Fun with the Calendar*. See "Young Owl Books," p. 15. Grades 2-4.

Information about year, months, days of a year, weeks, and days of a month presented in an interesting way. Most pages end with questions.

FRANCOISE. *What Time Is It, Jeanne-Marie?* Scribner, 1963, unpaged, $3.25. Grades K-2.

A clock face and brief text correlate times of day to various events in Jeanne-Marie's day.

FRISKEY, MARGARET. *Chicken Little, Count-to-Ten*. Childrens, 1946, 28 pp., $2.50. Grades 1-2.

Chicken Little meets animals in groups of one through ten and identifies the number in each group.

FRISKEY, MARGARET (ed.). *About Measurement*. Based on "A History of Mathematics," Ford Motor Company. Childrens, 1965, 31 pp., $2.50. Grades 3-6.

A simply written and illustrated story about the history of units of length—cubit, foot, inch, fathom, yard, rod, furlong, meter, and light-year.

FROMAN, ROBERT. *Faster and Faster, a Book About Speed*. Illustrated by Arnold Spilka. Viking, 1965, 43 pp., $3.00. Grades 3-5.

An imaginative comparison of the speed of snails, turtles, people, horses, fish, cheetahs, birds, boats, automobiles, airplanes, the wind, sound, the earth, spacecraft, light waves, and radio waves.

GAG, WANDA. *Millions of Cats*. Coward, 1928, 30 pp., $2.75. Grades K-2.

The story of an old man's quest to find a cat for his wife provides children with readiness experience for large numbers.

GARDNER, MARTIN. *Archimedes, Mathematician and Inventor*. Illustrated by Leonard Everett Fisher. Macmillan, 1965, 41 pp., $2.95. Grades 3-6.

The story of the life, work, and influence of a great Greek mathematician who solved hundreds of problems more than 2,000 years ago.

GEISEL, T. S. See SEUSS, DR.

GLEICK, BETH YOUMAN. *Time Is When*. Illustrated by Harvey Weiss. Rand, 1960, unpaged, $2.75. Grades 1-3.

Simple, easy text about seconds, minutes, hours, days, weeks, months, seasons, and years.

GRANT, ELDON. *Twenty White Horses*. See "Young Owl Books," p. 15. Grades 2-4.

Set of twenty horses used to show need for division.

GREENHOOD, DAVID. *Watch the Tides*. Illustrated by Jane Castle. Holiday, 1961, unpaged, $2.95. Grades 1-3.

This beautifully written science book about the oceans and their behavior helps in the development of the language of comparison.

HALL, WILLIAM. *Captain Murphy's Tugboats*. See "Little Owl Books," p. 8. Grades K-2.

Counting and addition of ones.

HENGESBAUGH, JANE. *I Live in So Many Places*. Illustrated by Katherine Evans. Childrens, 1956, unpaged, $2.50. Grades 1-3.

Relative position is developed by a child who tells of living in a house on a street in a county in a state of the United States on the North American continent in the Western Hemisphere on the earth, a part of the universe.

HIGHLAND, ESTHER HARRIS, and HIGHLAND, HAROLD JOSEPH. *The How and Why Wonder Book of Mathematics*. Illustrated by Walter Ferguson. Grosset, 1961, 48 pp., $2.08. Grades 2-6.

A very, very brief overview of some mathematical topics such as numbers, numerals, history of mathematics, probability, and topology.

HOBERMAN, MARY ANN, and HOBERMAN, NORMAN. *All My Shoes Come in Twos*. Little, 1957, 48 pp., $2.95. Grades 1-3.

A story in rhyme tells about all kinds of shoes and uses the idea of two over and over again.

HOGAN, INEZ. *Twin Lambs*. Dutton, 1951, 44 pp., $2.43. Grades K-2.

The story of twin lambs who wander away from their flock develops the ideas of same size, same shape, together, and distance.

HUGHES, PETER. *The Emperor's Oblong Pancake*. Abelard, 1962, unpaged, $2.95. Grades 1-3.

Delightful story of a king's discovery as a result of trying to change everything including the sun into the shape of an "oblong." Language includes ordinal number and comparison of size and shape.

IPCAR, DAHLOV. *Brown Cow Farm*. Doubleday, 1959, unpaged, $3.25. Grades K-2.

A book that counts the animals (1-100) on a farm in winter and spring. Excellent text and illustrations.

———. *Ten Big Farms*. Knopf, 1958, unpaged, $3.29. Grades K-3.

The ordinal numbers from one to ten are developed in this interesting story of a city family that sets out to buy a farm.

JACOBS, LELAND B. (compiler). *Delight in Number*. See. "Young Owl Books," p. 15. Grades 2-4.

Collection of poems using number.

JORDAN, HELENE J. *How a Seed Grows*. Illustrated by Joseph Low. Crowell, 1960, unpaged, $3.25. Grades K-1.

Illustrates use of numerals to keep an account of a series of events.

KAUFMAN, JOE. *Big and Little*. Golden, 1966, unpaged, $2.39. Grades K-2.

Pictures and simple text for comparisons of large and small objects.

KAY, HELEN. *One Mitten Lewis*. Illustrated by Kurt Werth. Lothrop, 1955, unpaged, $3.25. Grades 1-3.

This humorous story about a little boy who is always losing one mitten frequently employs the words *pair, both, one, each, first,* and *next*.

KESSLER, LEONARD. *I Made a Line*. Grosset, 1962, 61 pp., 59c. Grades 1-3.

Some language of position and of geometry used as a boy thinks about his drawings of a line.

KETTELKAMP, LARRY. *Kites*. Morrow, 1959, 48 pp., $2.75. Grades 3-7.

A description of kites and kite-building projects making use of language of measurement and geometry.

KRASILOVSKY, PHYLLIS. *The Very Little Boy*. Illustrated by Ninon. Doubleday, 1962, unpaged, $2.95. Grades K-1.

Language of comparison used in this story of a very little boy as he grows into a bigger boy.

———. *The Very Little Girl*. Illustrated by Ninon. Doubleday, 1953, unpaged, $2.50. Grades K-1.

Size is illustrated as a little girl who is smaller than a rose bush or a kitchen stool grows until she can reach a door handle, eat at a big table, and be a big sister.

KRAUSS, RUTH. *The Growing Story*. Illustrated by Phyllis Rowland. Harper, 1947, 32 pp., $3.25. Grades K-2.

A little boy watches the flowers and animals grow all summer and discovers that he, too, has grown. Concepts of comparison and quantity are used.

KRUSS, JAMES. *3 × 3. Three by Three*. Illustrated by Eva Rubin. Macmillan, 1965, unpaged, $3.50. Grade K.

A read-aloud picture book about sets of three animals and other objects. Simple story with bold, charming illustrations.

LAUBER, PATRICIA. *The Story of Numbers*. Illustrated by Mircea Vasiliu. Random, 1961, 80 pp., $1.95. Grades 3-5.

An easy-to-read story of a probable history of number and of the invention of numerals.

LEAF, MUNRO. *Arithmetic Can Be Fun*. Lippincott, 1949, 64 pp., $2.95. Grades 1-3.

Considers fractions, counting, measurement, the operations of addition and subtraction, and why arithmetic is important.

LEWELLEN, JOHN. *The True Book of Airports and Airplanes*. Illustrated by Richard Gates. Childrens, 1956, 46 pp., $2.50. Grades 1-3.

Language of number, position, comparison, and measurement appears in this simple, factual book about airports.

LEWIS, ALFRED. *New World of Computers*. Dodd, 1965, 79 pp., $3.00. Grades 3-8.

A brief history of various computing devices and a description of the kinds of work done by the electronic computers, chiefly the digital type.

LIONNI, LEO. *Inch by Inch.* Grosset, 1960, unpaged, $3.95. Grades K-1.

Beginning idea of an inch as a unit of length developed as an inchworm is shown measuring objects of nature. Beautifully illustrated.

"Little Owl Books." Holt, 1963, unpaged, $55.95 per set (books not sold individually). Grades K-2.

A set of forty books for an individualized supplementary reading program. The following ten books relate to mathematics: *Captain Murphy's Tugboats,* by William Hall; *Five Is 5,* by Howard F. Fehr; *Going Up, Going Down,* by H. R. Wittram; *One, Two, Three, Four,* by Ruby Schuler and Kate Considine; *Poems for Counting* and *Round Is a Pancake,* by Joan Sullivan; *Ten Pennies for Candy,* by Henry Ritchet Wing; *This Is My Family,* by Howard F. Fehr; *Three Little Dachshunds,* by Margaret Otto; and *What Is Big?* by Henry Ritchet Wing.

MACAGY, DOUGLAS, and MACAGY, ELIZABETH. *Going for a Walk with a Line.* Doubleday, 1959, unpaged, $3.95. Grades 2-7.

The line and its use in famous modern paintings are presented with brief text and reproductions of the paintings.

MCLEOD, EMILIE WARREN. *One Snail and Me.* Illustrated by Walter Lorraine. Little, 1961, 32 pp., $3.25. Grades K-1.

A beautifully illustrated picture book to develop the concepts of one through ten.

———. *The Seven Remarkable Bears.* Illustrated by Juliet Kepes. Houghton, 1954, 46 pp., $3.25. Grades K-3.

Po, the only polar bear in a city zoo, was bored and unhappy until he had a bright idea that changed his world. Ordinal and cardinal numbers through seven and concepts of position and comparison are used.

MALTER, MORTON S. *Our Largest Animals.* Illustrated by Dirk Gringhuis. Whitman, 1958, 31 pp., $2.00. Grades 3-6.

Language of relative size, weight, and time and many number names from one to 12,000 effectively used as the largest animals of the world are described.

———. *Our Tiniest Animals.* Illustrated by Dirk Gringhuis. Whitman, 1955, 32 pp., $2.00. Grades 3-5.

Language of number, weight, time, and relative size used to describe the life of small animals.

MARINO, DOROTHY. *Edward and the Boxes*. Lippincott, 1957, unpaged, $2.93. Grades 1-3.

A boy collects boxes to make houses the right size for himself and his pets.

MEMLING, CARL. *I Can Count*. Illustrated by Feodor Rojankovsky. Golden, 1963, unpaged, $2.39. Grades K-1.

A counting book based on pictures of sets of animals, one to ten.

———. *10 Little Animals*. Illustrated by Feodor Rojankovsky. Golden, 1961, unpaged, $1.29. Grades K-2.

A counting story that uses both names and numerals for the numbers ten to one.

MILGROM, HARRY. *Adventures with a Ball*. Illustrated by the Strimbans. Dutton, 1965, 31 pp., $2.50. Grades 1-3.

A book that helps children think about the characteristics of a ball-shaped object, the sphere.

MURRAY, WILLIAM D., and RIGNEY, FRANCIS J. *Paper Folding for Beginners*. Dover, 1960, 94 pp., paper, $1.00. Grades 3-8.

Descriptions for making objects by folding, tearing, or cutting paper.

MYLLER, ROLF. *How Big Is a Foot?* Atheneum, 1962, unpaged, $2.95. Grades 1-3.

An amusing story of the first use of the foot as a unit of measure. Children will find the book more fun after they have used the inch, foot, and yard as units of measure.

NOHELTY, SALLY (compiler). *Eleven and Three Are Poetry*. See "Young Owl Books," p. 15. Grades 2-4.

Collection of counting rhymes.

NORLING, JO, and NORLING, ERNEST. *Pogo's Sea Trip: A Story of Boats*. Holt, 1949, 50 pp., $2.23. Grades 1-3.

The story of a tugboat trip makes wide use of number and comparison.

ORLEANS, ILO. *I Watch the World Go By*. Illustrated by Pelagie Doane. Walck, 1961, 48 pp., $3.00. Grades 2-3.

Some of the poems in this book help to develop concepts of size, position, time, and number.

OTTO, MARGARET. *Three Little Dachshunds*. See "Little Owl Books," p. 8. Grades K-2.

Story of three lost dachshunds and two children. Uses numbers one through three.

PINE, TILLIE S., and LEVINE, JOSEPH. *The Chinese Knew*. Illustrated by Ezra J. Keats. McGraw, 1958, 32 pp., $2.95. Grades K-4.

The ancient Chinese employed the same scientific principles we use today in making ink and paper, in making and using the abacus and water clock, and in other activities. Includes directions for making some of the objects as well as experiments for proving the principles involved.

Poems for Counting. See "Little Owl Books," p. 8. Grades K-2.

A cleverly illustrated collection of counting poems from a variety of sources.

POSELL, ELSA. *True Book of Whales*. Childrens, 1963, 47 pp., $2.50. Grades 1-3.

Interestingly presented information about whales; uses ideas of number, size, distance, time, and weight.

ROSSETTI, CHRISTINA. *Adding: A Poem*. See "Young Owl Books," p. 15. Grades 2-4.

Pictures and two-line rhymes about addition situations.

ROTHSCHILD, ALICE. *Bad Trouble in Miss Alcorn's Class*. Illustrated by Irwin Rosenhouse. Scott, 1959, 101 pp., $3.00. Grades 1-3.

A wise teacher and children solve the problem of stealing in a second grade. The vocabulary of number, position, relationship, and time is used.

RUSSELL, SOLVEIG PAULSON. *Lines and Shapes*. Illustrated by Arnold Spilka. Walck, 1965, 31 pp., $3.25. Grades 3-5.

A clever introduction, with easy-to-read text and drawings, to some very elementary geometric ideas that are shown by objects in the world around us. Some ideas used are lines, angles, polygons, and spheres.

SCHLEIN, MIRIAM. *City Boy, Country Boy*. Illustrated by Katherine Evans. Childrens, 1955, unpaged, $2.50. Grades 2-3.

A boy who lives in the country and one who lives in the city each describes his life during one year, using concepts of time, size, position, and number.

———. *Fast Is Not a Ladybug*. Illustrated by Leonard Kessler. Scott, 1953, unpaged, $2.75. Grades K-3.

Narrative about moving objects helps to make clear the concepts of fast and slow.

———. *Heavy Is a Hippopotamus*. Illustrated by Leonard Kessler. Scott, 1954, unpaged, $2.75. Grades K-3.

Excellent text and illustrations help clarify the relative nature of light and heavy. What is heavy for an ant is light for a child; what is heavy to a child is light to a hippopotamus.

———. *It's About Time*. Illustrated by Leonard Kessler. Scott, 1955, unpaged, $2.75. Grades 1-3.

Verse and pictures develop units of time, such as second, minute, hour, and day.

———. *Shapes*. Illustrated by Sam Berman. Scott, 1952, unpaged, $2.75. Grades K-2.

Familiar objects help develop geometric concepts of round, square, line, straight line, curve, long, and tall.

SCHULER, RUBY, and CONSIDINE, KATE. *One, Two, Three, Four*. See "Little Owl Books," p. 8. Grades K-2.

Introduces numbers from one through twelve with sets of animals and first through twelfth with months of the year.

SCHWARTZ, JULIUS. *The Earth Is Your Spaceship*. Illustrated by Marc Simont. McGraw, 1963, 32 pp., $2.50. Grades 2-3.

Explains how the reader, like a rider on a spaceship, has orbited the sun once for each year in his age.

SELFRIDGE, OLIVER G. *Fingers Come in Fives*. Illustrated by Murray Tinkelman. Houghton, 1966, 44 pp., $3.07. Grades 2-5.

A delightful book that tells of the use of specific numbers, for example, each number 1 to 16, 40, 52, 666, and 31,536,000.

SEUSS, DR. (pseudonym of T. S. GEISEL) *McElligot's Pool*. Random, 1947, 56 pp., $2.95. Grades K-3.

The story of a little boy who imagines what he can catch as he fishes in a small pool; uses ideas of number, comparison, shape, size, length, and height.

———. *Yertle the Turtle*. Random, 1958, unpaged, $2.95. Grades K-3.

Yertle uses concepts of number, comparison, and measurement as he yearns for a higher throne and a larger kingdom and attempts to get them.

SHAPP, CHARLES, and SHAPP, MARTHA. *Let's Find Out What's Big and What's Small.* Illustrated by Vana Earle. Hale, 1959, unpaged, $1.83. Grades 1-3.

Text and pictures show vividly the relative meaning of size. These questions are discussed: What is big? What is small? What is short? What is tall?

SHARP, ELIZABETH N. *Simple Machines and How They Work.* Illustrated by Ida Scheib. Random, 1959, 96 pp., $1.95. Grades 1-3.

This account of wheels, pulleys, levers, screws, wedges, and inclined planes, with experiments to prove their usefulness, makes extensive use of the language of size, position, and comparison.

SIMON, LEONARD. *Counting Lightly.* See "Young Owl Books," p. 15. Grades 2-4.

A story that shows the need for number, names for numbers, and counting.

———. *Stretching Numbers.* See "Young Owl Books," p. 15. Grades 2-4.

Story based on the approximate nature of measurement of length.

SLOBODKIN, LOUIS. *Millions and Millions.* Vanguard, 1955, unpaged, $3.95. Grades K-1.

Pictures and text combine to develop effectively the idea of millions as many.

———. *One Is Good but Two Are Better.* Vanguard, 1956, unpaged, $3.95. Grade K.

Ideas of one and two are developed through examples of activities in which two can play better than one.

STOVER, JOANN. *Why? Because.* Illustrated by the author. McKay, 1961, unpaged, $3.44. Grades K-1.

Uses some language of geometry as it gives some amusing reasons. For example, "A ball is round because if it were square, it couldn't roll."

SULLIVAN, JOAN. *Poems for Counting.* See "Little Owl Books," p. 8. Grades K-2.

———. *Round Is a Pancake.* See "Little Owl Books," p. 8. Grades K-2.

Many round objects are pictured and named in rhyme.

TRESSELT, ALVIN. *Follow the Road.* Illustrated by Roger Duvoisin. Lothrop, 1953, unpaged, $2.84. Grades 1-2.

Ideas of space, time, quantity, and size are used to tell about a small boy who decides to take his wagon and follow the road.

TRUE, LOUISE, and OWENS, LILLIAN. *Number Men.* Childrens, 1948, 32 pp., $2.50. Grades 1-2.

Directions for writing the number symbols from one to ten, given in verse. The pictures of groups of objects are simple and easy to use.

TUDOR, TASHA. *Around the Year.* Walck, 1957, 56 pp., $3.75. Grades K-3.

Effective pictures and verse tell about each month of the year.

———. *1 Is One.* Walck, 1956, unpaged, $3.75. Grades K-1.

This counting book effectively illustrates each number group from one through twenty.

VOGEL, ILSE MARGRET. *1 Is No Fun, but 20 Is Plenty.* Atheneum, 1965, unpaged, $2.95. Grades K-1.

An attractive picture book with conversation in rhyme about sets of 1 to 20 objects.

WATSON, NANCY DINGMAN. *Annie's Spending Spree.* Illustrated by Aldren A. Watson. Viking, 1957, 45 pp., $3.25. Grades K-3.

Annie learns about her birthday dollar in terms of half-dollars, quarters, dimes, nickels, and cents. Her adventure at a store helps her appreciate its value as she finds what she can buy.

———. *What Is One?* Illustrated by Aldren A. Watson. Knopf, 1954, unpaged, $2.59. Grades K-1.

A boy uses easy and commonplace examples to teach his younger sister the meaning of the numbers from one to ten.

———. *When Is Tomorrow?* Illustrated by Aldren A. Watson. Knopf, 1955, unpaged, $2.75. Grades K-1.

Linda's confusion with tomorrow and today provides an opportunity for children to develop a better understanding of the concept of time.

WEBBER, IRMA E. *It Looks like This.* Hale, 1958, unpaged, $1.75. Grades 1-3.

Four mice look at animals from different views: front, back, side, and above. Each animal presents different pictures, depending on the position of the viewer. The mice conclude that one object can have as many different appearances as there are ways to look at it.

WHITE, FLORENCE. *1 Boy Lives in My House*. Illustrated by Aliki. Golden, 1965, unpaged, $1.29. Grades K-2.

A counting story that uses numbers and numerals one through ten.

WING, HENRY RITCHET. *Ten Pennies for Candy*. See "Little Owl Books," p. 8. Grades K-2.

Problem: Will ten pennies buy candy for a boy and his friends?

———. *What Is Big?* See "Little Owl Books," p. 8. Grades K-2.

Comparison of the size of a child with that of larger and smaller animals.

WITTRAM, H. R. *Going Up, Going Down*. See "Little Owl Books," p. 8. Grades K-2.

The elevator shaft in a children's toy shop becomes a number line, the basis for questions about sequence of numbers.

WOLFF, JANET, and OWETT, BERNARD. *Let's Imagine Numbers!* Dutton, 1964, unpaged, $3.50. Grades 1-2.

A picture book with simple text for the development of the number ideas for one through twelve and a few larger numbers.

WONDRISKA, WILLIAM. *1, 2, 3, a Book to See*. Pantheon, 1959, unpaged, $2.09. Grades K-1.

Number symbols from one through ten are illustrated by large, clear pictures of sets of things. Excellent material for development of number and counting.

WOOLLEY, CATHERINE. *Two Hundred Pennies*. Morrow, 1947, 128 pp., $3.25. Grades 1-3.

The value of a dollar in pennies is developed, and addition and subtraction ideas are introduced through this story of a boy who wants to buy a train.

WRIGHT, H. R. *Four Threes Are 12*. See "Young Owl Books," p. 15. Grades 2-4.

Description and pictures of objects that show multiplication situations.

———. *A Maker of Boxes*. See "Young Owl Books," p. 15. Grades 2-4.

Clever story that shows many solids and how to draw and make models of the solids.

"Young Owl Books." Holt, 1964, $65.95 per set (books not sold individually). Grades 2-4.

A set of forty books for an individualized supplementary reading program. The following ten books relate to mathematics: *Adding: A Poem,* by Christina Rossetti; *Counting Lightly,* by Leonard Simon; *Delight in Number,* by Leland B. Jacobs (compiler); *Eleven and Three Are Poetry,* by Sally Nohelty (compiler); *Four Threes Are 12,* by H. R. Wright; *Fun with the Calendar,* by Henry W. Ford; *If You Can Count to Ten,* by Howard F. Fehr; *A Maker of Boxes,* by H. R. Wright; *Stretching Numbers,* by Leonard Simon; *Twenty White Horses,* by Eldon Grant.

ZINER, FEENIE, and THOMPSON, ELIZABETH. *The True Book of Time.* Childrens, 1956, unpaged, $2.50. Grades 1-3.

Different ways people have recorded the passing of time are explained, and an easy lesson is given on the modern clock.

ZOLOTOW, CHARLOTTE. *One Step, Two . . . .* Illustrated by Roger Duvoisin. Lothrop, 1955, unpaged, $3.75. Grade K.

Ellen and her mother take a walk and use the vocabulary of number, comparison, position, size, shape, and time as they describe what they see. The illustrations are effective.

———. *Over and Over.* Illustrated by Garth Williams. Harper, 1957, unpaged, $3.50. Grade K.

Holiday after holiday comes for a little girl, and she wishes for them all to come again. This book is excellent for developing the idea of time.

Intermediate Grades

ADLER, IRVING. *The Giant Golden Book of Mathematics*. Illustrated by Lowell Hess. Golden, 1960, 96 pp., $4.99. Grades 5-8.

A collection of short expositions on a variety of mathematical topics. Included are number symbolism, measures, primes, applications, and some short biographical sketches. It is well illustrated and has a good index.

———. *Magic House of Numbers*. Illustrated by Ruth Adler. Day, 1957, 128 pp., $3.50. New American, paper. Grades 6-8.

The basic hows and whys of our number system made interesting through mathematical curiosities, riddles, tricks, and games.

———. *Time in Your Life*. Illustrated by Ruth Adler. Day, 1955, 127 pp., $3.50. Grades 5-8.

Man's reliance upon the sun, moon, and stars as indicators of time; early and modern timepieces; the history of the calendar; time zones; and other important influences of time in our lives are considered.

ADLER, IRVING, and ADLER, RUTH. *Numbers Old and New*. Illustrated by Peggy Adler. Day, 1960, 48 pp., $2.68. Grades 4-6.

Considers old and new ways of counting, ways of writing symbols for numbers, broken numbers, square numbers, magic squares, and number tricks.

———. *Numerals: New Dresses for Old Numbers*. Illustrated by Ruth Adler. Day, 1964, 48 pp., $2.68. Grades 4-6.

A book about numerals of a base-ten numeration system and of other bases and the use of the numerals to show operations on numbers. Exercises with answers are included.

ANDREWS, F. EMERSON. *Numbers, Please*. Illustrated by Aldren A. Watson. Little, 1961, 101 pp., $3.75. Grades 4-8.

A book about the language we use to speak about numbers, operations on them, and relations among them—numeration systems. Includes some tricks and shortcuts that result from particular symbolisms.

BARNARD, D. ST. P. *A Book of Mathematical and Reasoning Problems: Fifty Brain-Twisters*. Van Nostrand, 1963, 109 pp., $2.50. Grades 6-8.

A collection of fifty "reasoning" problems. Special sections provide "leads" or hints for solutions. The solutions generally stress the mathematical nature of the reasoning involved.

———. *One Hundred Braintwisters*. Van Nostrand, 1967, 168 pp., $3.95. Grades 6-8.

A continuation of the collection in the author's *Fifty Brain-Twisters*. Also includes leads and solutions.

BARR, DONALD. *Arithmetic for Billy Goats*. See p. 1.

BEHN, HARRY. *All Kinds of Time*. See p. 1.

BELL, THELMA. *Snow*. Illustrated by Corydon Bell. Viking, 1954, 56 pp., $3.00. Grades 4-7.

A carefully written account about snowflakes, their formation, and related icy forms; employs ideas of geometry, measurement, and fractions.

BENDICK, JEANNE. *All Around You*. See p. 2.

———. *Archimedes and the Door of Science*. Watts, 1962, 143 pp., $2.95. Grades 5-8.

An interestingly written story of Archimedes, a mathematician, inventor, and pioneer of the scientific method. Some elementary ideas of science and mathematics used by Archimedes are discussed in an interesting way. Simply and effectively illustrated.

———. *The First Book of Time*. Illustrated by the author. Watts, 1963, 70 pp., $2.65. Grades 4-6.

An account of the natural and artificial units man has for measuring time and the instruments he uses.

———. *How Much and How Many*. McGraw, 1947, 188 pp., $2.95. Grades 5-8.

This story gives both the historical background and modern applications of weights and measures. It is an excellent source book.

BENDICK, JEANNE, and LEVINE, MARCIA O. *Mathematics Illustrated Dictionary*. McGraw, 1965, 223 pp., $4.50. Grades 4-8.

Definitions, descriptions, explanations, and illustrations of mathematical terms. Also contains some interesting problems, brief biographies, tables of symbols, formulas, weights and measures, square roots, and logarithms. Valuable reference for any school library.

———. *Take a Number*. McGraw, 1961, 63 pp., $2.75. Grades 4-6.

Easy-to-read discussion of the history of numeration, the binary system and computers, the number of numbers, perfect numbers, prime numbers, and fun with numbers.

———. *Take Shapes, Lines and Letters*. McGraw, 1962, 79 pp., $2.95. Grades 4-8.

Interesting, simple text and drawings suggest many geometric, topological, and related mathematical ideas. Emphasizes that although models are useful, mathematics is "an adventure of the mind."

BERG, OLIVE S. *I've Got Your Number, John*. See "Wise Owl Books," p. 29. Grades 4-6.

A personal letter to a child reminds him of the importance of numbers.

BERRY, ERICK. *Charles Proteus Steinmetz*. Illustrated by John Martinez. Macmillan, 1966, 41 pp., $2.95. Grades 4-7.

Brief biography of the scientist from his school days in Europe and emigration to New York to his subsequent success in experimenting with and developing electrical devices that have greatlv changed the world.

BLOUGH, GLENN O. *Wait for the Sunshine*. See p. 2.

BOEKE, KEES. *Cosmic View: The Universe in 40 Jumps*. Day, 1957, 48 pp., $3.75. Grades 4-6.

A series of pictures and drawings with descriptive text to show the idea of scale and relative sizes of objects from galaxies to nuclei of sodium atoms. A familiar object is first pictured one-tenth life size and is successively represented with other objects in drawings until the scale is $1:10^{26}$. Similarly, a small portion is successively enlarged until the scale is $10^{13}:1$.

BOWERS, HENRY, and BOWERS, JOAN E. *Arithmetical Excursions: An Enrichment of Elementary Mathematics*. Dover, 1961, 320 pp., paper, $1.65. Grades 5-8.

A large collection of mathematical miscellanea. Each section includes a set of exercises with answers.

BRAGDON, LILLIAN J. *Tell Me the Time, Please.* Lippincott, 1946, 103 pp., $2.12. Grades 4-8.

How time has been kept by stars, shadows, water clocks, hourglasses, and modern clocks is described; and time zones in the United States are discussed.

BRANLEY, FRANKLYN M. *North, South, East, and West.* See p. 2.

BRINDZE, RUTH. *The Story of Our Calendar.* Vanguard, 1949, 64 pp., $3.95. Grades 4-8.

Information about the different types of calendars developed through the ages; the use made of the sun, moon, and stars in keeping time records; the international date line; latitude and longitude; and Greenwich time.

BROOKE, MAXEY. *150 Puzzles in Crypt-Arithmetic.* Dover, 1963, 71 pp., paper, $1.00. Grades 5-8.

A wealth of easy-to-difficult puzzles that are formulated by substituting letters for digits. A general method of solution is suggested. Answers to all puzzles are included.

BUEHR, WALTER. *Keeping Time.* Putnam, 1960, 94 pp., $3.00. Grades 4-6.

Story of need for and attempts to keep track of time. There are chapters on the calendar, time-keeping instruments, and clockmakers.

BUFF, MARY, and BUFF, CONRAD. *Big Tree.* Viking, 1946, 80 pp., $3.50. Grades 5-8.

The life of a giant redwood tree with its friends and enemies through the centuries illustrates the concepts of time and size.

BURLINGAME, ROGER. *Dictator Clock: 5,000 Years of Telling Time.* Macmillan, 1966, 166 pp., $3.95. Grades 5-8.

Description of how events are controlled and regulated by time, of efforts to improve tools that measure time, and of experiments using the most accurate of clocks that might verify Einstein's prediction that clocks moving at speeds approaching the speed of light will slow down.

CARLSON, BERNICE W. *Make It and Use It.* Illustrated by Aline Hansens. Abingdon, 1958, 160 pp., $2.50. Grades 4-6.

More than 100 inexpensive, easy-to-do projects, with clear directions and helpful pictures, require the use of measurement ideas.

DAVIS, BARBARA. *Learning Science Through Cooking*. Drawings by Diana Medworth. Sterling, 1964, 80 pp., $3.95. Grades 5-8.

Ideas of measurement used in simple recipes and experiments in the kitchen.

DEGRAZIA, JOSEPH. *Math Is Fun*. Emerson, 1954, 159 pp., $2.95. Grades 5-8.

A collection of easy-to-difficult mathematical puzzles, with answers.

DIGGINS, JULIA E. *String, Straightedge, and Shadow: The Story of Geometry*. Viking, 1965, 160 pp., $5.00. Grades 5-8.

The story of how man's practical need to measure and his curiosity about order in the universe led to the development of geometry.

DRIPDALE, THOMAS, and DUNWORTH, JOHN. *Millions of People*. See "Wise Owl Books," p. 29. Grades 4-6.

Interpretation of graphs that give information about population.

EPSTEIN, BERYL, and EPSTEIN, SAM. *The First Book of Measurement*. Illustrated by Walter Buehr. Watts, 1960, 60 pp., $2.65. Grades 5-8.

Approaches measurement as providing a means to answer such questions as "How big?" and "How fast?" History of the standardizing of units for weight, length, temperature and time, and the development of suitable instruments of measure.

ESTEP, IRENE. *Good Times with Maps*. Illustrated by Robert Smith. Childrens, 1962, 31 pp., $2.50. Grades 4-5.

Easy-to-read text and pictures on the construction of maps and their use. One section, "The Scale of Miles," is helpful for developing concepts of measurement.

FEHR, HOWARD F. *If You Can Count to Ten*. See "Young Owl Books," p. 15.

———. *Number Patterns Make Sense*. See "Wise Owl Books," p. 29. Grades 4-6.

Interesting ways of performing operations, and other patterns.

FENTON, CARROLL L., and FENTON, MILDRED A. *Worlds in the Sky*. Day, 1950, 96 pp., $3.29. Grades 5-7.

Ideas of distance and size are utilized in this informative book about the sun, planets, moon, and stars.

FERAVOLO, ROCCO. *Wonders of Mathematics*. Dodd, 1963, 64 pp., $2.79. Grades 5-8.

How mathematics was developed and has been and is being used by man. Simple activities and problems to demonstrate what mathematics can do.

FORD, HENRY W. *Dr. Frick and His Fractions*. See "Wise Owl Books," p. 29. Grades 4-6.

Fractions used to describe a magician's tricks. Some interesting and challenging problems are included.

———. *Fun with the Calendar*. See "Young Owl Books," p. 15.

FOWLER, H. WALLER, JR. *Kites*. Ronald, 1953, 95 pp., $3.50. Grades 5-8.

A detailed description of different types of kites, their history, and their construction. This book can contribute to the development of measurement, comparison, and geometric ideas.

FREEMAN, MAE BLACKER. *The Story of Albert Einstein*. Random, 1958, 178 pp., $2.95. Grades 5-9.

Easy-to-read biography of a mathematician and scientist who spent a lifetime searching for the secrets of the universe.

FREEMAN, MAE BLACKER, and FREEMAN, IRA. *Fun with Astronomy*. Random, 1953, 57 pp., $1.95. Grades 4-8.

Source book applies ideas of measurement of time and distance. Many simple experiments are suggested.

———. *Fun with Figures*. Random, 1946, 60 pp., $1.95. Grades 5-8.

Fun with geometry results from following the suggested experiments with straight-line figures, curves, and solids.

FRISKEY, MARGARET (ed.). *About Measurement*. See p. 4.

FROHLICHSTEIN, JACK. *Mathematical Fun, Games and Puzzles*. Smith, 1962, 306 pp., $3.75. Grades 5-8.

A book (with answers) of 334 puzzles, 20 games, 37 fun novelties, and 27 projects that are graded as easy, average, or difficult. Ideas from arithmetic, algebra, and geometry are used.

FROMAN, ROBERT. *Faster and Faster, a Book About Speed*. See p. 4.

GALT, TOM. *Seven Days from Sunday*. Illustrated by Don Freeman. Crowell, 1956, 215 pp., $3.95. Grades 4-8.

The origin of the seven-day week is described; special attention is given to the way folklore and myths about the gods influenced the naming of the days.

GARDNER, MARTIN. *Archimedes, Mathematician and Inventor*. See p. 5.

GRANT, ELDON. *Twenty White Horses*. See "Young Owl Books," p. 15.

HAAS, VICTOR E. *The Magic Numerals of Ali Khayyan*. Macrae, 1965, 155 pp., $3.50. Grades 5-8.

A fantasy in which Ali takes a trip to many countries that use numeration systems based on numbers other than ten. In each he learns to interpret the numerals and the difference between number and numeral.

HIGHLAND, ESTHER HARRIS, and HIGHLAND, HAROLD JOSEPH. *The How and Why Wonder Book of Mathematics*. See p. 5.

HOGBEN, LANCELOT. *The Wonderful World of Mathematics*. Doubleday, 1955, 69 pp., $2.95. Grades 5-8.

The growth and development of mathematics through the ages described in story and pictures.

HOPWOOD, ROBERT R. *Science Model Making*. Macmillan, 1963, 208 pp., $4.95. Grades 6-8.

A description of how to make 32 models and the simple theory of how they work. Included are a pocket sundial, theodolite, and sextant.

HUNTER, J. A. H. *Fun with Figures*. Dover, 1956, 109 pp., paper, $1.00. Grades 5-8.

A collection of 150 mathematical puzzles presented in the form of anecdotes. Solutions require the use of arithmetic, algebra, geometry, and logic. Answers and a few sample solutions are included.

———. *More Fun with Figures*. Dover, 1966, 109 pp., paper, $1.00. Grades 5-8.

A collection of 150 mathematical problems (teasers) similar to those in *Fun with Figures*.

HUNTER, J. A. H., and MADACHY, JOSEPH S. *Mathematical Diversions*. Van Nostrand, 1963, 178 pp., $4.95. Grades 6-8.

A collection of almost a hundred problems classified under such headings as paradoxes, mystic arrays, topological delights, and teasers. Solutions included.

JACOBS, LELAND B. (compiler). *Delight in Number*. See "Young Owl Books," p. 15.

JOHNSON, DONOVAN A., and GLENN, WILLIAM H. "Exploring Mathematics on Your Own." McGraw, 1961, 303 pp., 18 books, paper, $15.12. Grades 6-8.

A wide variety of mathematical enrichment exercises with answers. The exercises range from those about sets, to number, to the Pythagorean theorem, and to topology.

JONAS, ARTHUR. *New Ways in Math*. Illustrated by Aliki. Prentice, 1962, 70 pp., $3.25. Grades 4-6.

Overview of the development of mathematics in relation to man's needs, including his need to count, to record numbers, and to compute; the convenience he finds in algebraic symbolism and knowing about probabilities; and the kinds of problems he solves with the help of mathematics without numbers.

JONES, MADELINE. *The Mysterious Flexagons*. Crown, 1965, 44 pp., paper, $1.95. Grades 4-8.

An introduction to flexagons through paper folding. Includes patterns and instructions for making five different flexagons.

JUSTER, NORMAN. *The Dot and the Line*. Random, 1963, unpaged, $1.95. Grades 5-8.

A very brief mathematical fable of a straight line and a point. Story and illustrations contribute to the development of geometric ideas.

———. *The Phantom Tollbooth*. Illustrated by Jules Feiffer. Random, 1961, 255 pp., $3.95. Grades 5-8.

A fantasy in which the importance of definitions is stressed. Some mathematical ideas are involved in the semantics with which the story unfolds.

KETTELKAMP, LARRY. *Kites*. See p. 6.

KOHN, BERNICE. *Computers at Your Service*. Illustrated by Aliki. Prentice, 1962, 72 pp., $3.50. Grades 4-8.

One section of this simply written book explains the binary system and its use by a computer.

LATHAM, JEAN LEE. *Carry On, Mr. Bowditch*. Illustrated by John O'Hara Cosgrave II. Houghton, 1955, 251 pp., $3.50. Grades 6-8.

Nathaniel Bowditch, apprentice to a ship's chandler in Salem in 1790, had only his own curiosity to encourage him to learn his "figures"; but before he was twenty-one he knew more than most ships' captains, and his tables for navigators have been guiding ships ever since. The story illustrates the importance and excitement of learning mathematics.

———. *Trail Blazer of the Seas*. Illustrated by Victor Mays. Houghton, 1956, 245 pp., $3.50. Grades 6-8.

The achievements of Matthew Fontaine Maury, the father of oceanography, are the result of his constant search for knowledge about the motion of the seas. His problem-solving methods are worth study.

LAUBER, PATRICIA. *The Story of Numbers*. See p. 7.

LEEMING, JOSEPH. *Fun with Puzzles*. Illustrated by Jessie Robinson. Lippincott, 1946, 128 pp., $3.95. Grades 4-8.

Collection of number puzzles and other types of mathematical puzzles involving coins, counters, and matches.

LERCH, HAROLD H. *Numbers in the Land of Hand*. Southern, 1966, 56 pp., $2.25. Grades 4-6.

An interesting historical development of numbers that uses unique number names and symbols (base five).

LEWIS, ALFRED. *New World of Computers*. See p. 7.

MACAGY, DOUGLAS, and MACAGY, ELIZABETH. *Going for a Walk with a Line*. See p. 8.

MCCLOSKEY, ROBERT. *Time of Wonder*. Viking, 1957, 63 pp., $3.50. Grades 4-6.

A description of the change of seasons on an island in Penobscot Bay makes wide use of the vocabulary of measurement and comparison.

MALTER, MORTON S. *Our Largest Animals*. See p. 8.

———. *Our Tiniest Animals*. See p. 8.

MARSHALL, ROY K. *Sundials*. Illustrated by Jerry Cailor. Macmillan, 1963, 126 pp., $3.50. Grades 6-8.

The story of the evaluation of sundials, their underlying principles, and how to construct them. Included is an original sundial in cutout form that will operate in any part of the world.

MASSOGLIA, ELINOR. *Fun-Time Paper Folding*. Illustrated by George Rhoads. Childrens, 1959, 31 pp., $2.50. Grades 4-6.

Using elementary language of comparison and shape, the author describes Japanese methods of making a sailboat, a fish, a swan, a basket, a flying bird, and other objects—all without resorting to cutting or pasting.

MOORE, LILIAN. *The Important Pockets of Paul*. Illustrated by William D. Hayes. McKay, 1954, 73 pp., $2.75. Grades 4-5.

Several stories tell about Paul's pockets, which are important to him because of the things they hold. He learns about a plumb line and perpendicular heights, and he makes a plumb line with a top and string from his pockets. The language of position, time, and number is employed.

MURRAY, WILLIAM D., and RIGNEY, FRANCIS J. *Paper Folding for Beginners*. See p. 9.

NEAL, HARRY E. *The Story of the Kite*. Illustrated by John Moment. Vanguard, 1954, 61 pp., $3.50. Grades 4-6.

The history and uses of kites are described. The directions given for making them require elementary concepts of measurement and geometry.

NEURATH, MARIE. *Too Small to See*. Sterling, 1957, 36 pp., $2.50. Grades 4-6.

The beginning idea of scale drawing is used through a description of what is seen under a powerful magnifying glass. Among the objects pictured are a drop of water, a fly's feet, and a honeycomb.

NEWELL, HOMER E., JR. *Space Book for Young People* (rev. ed.). Illustrated by Anne Marie Jauss. McGraw, 1960, 114 pp., $2.95. Grades 4-8.

Galaxies, comets, asteroids, artificial satellites, and their place in the universe are discussed. Ideas of number, measurement, and comparison are used.

NOHELTY, SALLY (compiler). *Eleven and Three Are Poetry*. See "Young Owl Books," p. 15.

NORMAN, GERTRUDE. *The First Book of Music*. Illustrated by Richard Gackenbach. Watts, 1954, 65 pp., $2.65. Grades 4-6.

In addition to a brief description of early music and musical instruments and a list of good music on records, this book contains a few pages illustrating the application of mathematics to music in the study of rhythm and the building of melodies.

PARKER, BERTHA MORRIS. *Golden Book of Science*. Illustrated by Harry McNaught. Golden, 1963, 98 pp., $3.95. Grades 4-6.

This book contains much material that uses concepts of comparison and measurement. There are special sections on time, size, rate, distance, and temperature.

PERKINS, WILMA LORD. *Fannie Farmer Junior Cook Book*. Illustrated by Martha Powell Setchell. Little, 1957, 208 pp., $3.95. Grades 5-8.

Simple and clear directions for 120 useful recipes requiring inexpensive ingredients. Equivalent liquid and dry measurements and fractions are among the mathematical ideas used.

PINE, TILLIE S., and LEVINE, JOSEPH. *The Chinese Knew*. See p. 10.

RIPLEY, ELIZABETH. *Leonardo da Vinci*. Walck, 1952, 67 pp., $4.00. Grades 4-8.

A text closely related to a varied selection of Leonardo's works. Designs for some of his machines and inventions are included.

ROSSETTI, CHRISTINA. *Adding: A Poem.* See "Young Owl Books," p. 15.

RUSSELL, SOLVEIG PAULSON. *Lines and Shapes.* See p. 10.

SCHLOAT, G. WARREN, JR. *Adventure of a Letter.* Scribner, 1949, 48 pp., $2.97. Grades 4-5.

Number, time, distance, and money are ideas used as a letter travels from Los Angeles, California, to White Plains, New York.

SCHNEIDER, HERMAN, and SCHNEIDER, NINA. *How Big Is Big?* Illustrated by A. F. Arnold. Hale, 1946, 42 pp., $1.95. Grades 4-6.

Sizes of many things are compared as a child relates himself to elephants, mountains, stars, mice, fleas, and atoms.

SCHWARTZ, JULIUS. *I Know a Magic House.* Illustrated by Marc Simont. McGraw, 1956, 32 pp., $2.95. Grades 4-6.

The wonders of everyday living are described: water comes right into the house, we are warmed by fire not in the room, music comes to our home by wire, and so on. Ideas of number, measurement, and position are used.

SCRIPTURE, NICHOLAS E. *Fifty Mathematical Puzzles and Oddities.* Van Nostrand, 1963, 84 pp., $2.50. Grades 5-8.

A collection of fifty oddments with new approaches, classified under arithmetic, algebra, geometry, and miscellaneous; all with answers.

SELFRIDGE, OLIVER G. *Fingers Come in Fives.* See p. 11.

SIMON, LEONARD. *Counting Lightly.* See "Young Owl Books," p. 15.

———. *Stretching Numbers.* See "Young Owl Books," p. 15.

SMITH, DAVID EUGENE. *Number Stories of Long Ago.* NCTM, 1919, 176 pp., paper, $1.00. Grades 5-8.

A famous historian relates the history of number, counting, and computing. He also includes some oddities and puzzles.

———. *The Wonderful Wonders of One-Two-Three.* Scripta, 1937, 47 pp., $1.25. Out of print. Grades 4-6.

A short history of our number symbols, number names, and the early use of numbers and a few number puzzles and oddities are contained in this book.

SMITH, DAVID EUGENE, and GINSBURG, JEKUTHIEL. *Numbers and Numerals*. NCTM, 1937, 62 pp., paper, 35c. Grades 5-8.

How our number system came into use, how some of the numerals came to have their present shape, how different number scales were used, how numbers were named, and interesting sections entitled "Mystery of Numbers" and "Number Pleasantries" are included in this book.

SMITH, GEORGE O. *Mathematics: The Language of Science*. Putnam, 1961, 72 pp., $2.95. Grades 5-8.

A brief history of a few important developments in mathematics that have affected science.

SOONG, MAYING. *The Art of Chinese Paper Folding*. Harcourt, 1948, 132 pp., $3.25. Grades 4-8.

Clear instructions and simple diagrams for constructing, without scissors and paste, such objects as hats, dollhouse furniture, Christmas-tree ornaments, and boats. The descriptions use many geometric terms and units for the measurement of length.

SOOTIN, LAURA. *Let's Go to a Bank*. Illustrated by Barbara Corrigan. Putnam, 1957, 47 pp., $1.97. Grades 4-6.

Bank activities are depicted through a visit to a teller's window, safe-deposit boxes, and vaults, and an explanation is given of checking and savings accounts.

STRIMBAN, JACK, and STRIMBAN, ROBERT. *Optical Illusions*. See "Wise Owl Books," p. 29. Grades 4-6.

A book of pictures presenting optical illusions, with a very simple question about each.

STONAKER, FRANCES BENSON. *Famous Mathematicians*. Lippincott, 1966, 118 pp., $3.50. Grades 4-8.

Brief biographies of Euclid, Archimedes, Aryabhatta, Al-Khowarizmi, Descartes, Newton, Lagrange, Gauss, Galois, Von Neumann, and Wiener, showing that mathematics was an exciting adventure to these men.

TANI, YUKIO. *The Magic Calculator: The Way of Abacus*. Japan, 1964, 64 pp., $1.00. Grades 4-8.

History of the Japanese abacus as a calculator and an exploration of how it is used. Exercises with answers.

TANNENBAUM, BEULAH, and STILLMAN, MYRA. *Understanding Maps*. McGraw, 1957, 144 pp., $3.25. Grades 5-8.

The problems of mapping the land, the sea, and the sky are discussed; and ideas of scale drawing, comparison, and measurement are applied.

TERRY, LEON. *The Mathmen*. McGraw, 1964, 222 pp., $3.95. Grades 6-8.

Contribution of nine men to mathematics—Thales, Pythagoras, Plato, Eudoxus, Aristotle, Euclid, Archimedes, Erastosthenes, and Hipparchus—and three famous problems: trisecting the angle, doubling the cube, and squaring the circle.

THURBER, JAMES. *The Great Quillow*. Illustrated by Doris Lee. Harcourt, 1944, 54 pp., $3.95. Grades 4-6.

A toymaker saves his fellow townsmen from a giant. This original and ingenious fairy tale utilizes concepts of number, measurement, and comparison.

———. *Many Moons*. Illustrated by Louis Slobodkin. Harcourt, 1943, 42 pp., $3.50. Grades 4-5.

A little princess wants the moon. This fantasy tells how her wish comes true, making use of ideas of number, measurement, and comparison.

VALENS, EVANS G. *Me and Frumpet: An Adventure with Size and Science*. Dutton, 1958, 128 pp., $2.75. Grades 4-6.

With this lighthearted story of a boy, a man made of pipe cleaners, a model railroad, and a proud father, readers are introduced to some elementary laws of science and the concept of relative size.

———. *The Number of Things: Pythagoras, Geometry and Humming Strings*. Dutton, 1964, 189 pp., $4.95. Grades 5-8.

The fascinating story of the search by the Pythagoreans for the designs that hold together geometry, music, nature, and other aspects of the world.

WERNER, ELSA JANE. *The Golden Book of Geography*. Golden, 1964, 96 pp., $2.99. Grades 4-6.

Comparison of size and ideas of time developed in relation to day and night and to time zones; a colorful and informative book.

WEYL, PETER. *Men, Ants, and Elephants: Size in the Animal World*. Illustrated by Anthony Ravielli. Viking, 1959, 103 pp., $3.00 Grades 5-8.

The comparative aspect of measurement and the arbitrary nature and importance of standard units of measurement are given significance through a discussion of size in the animal world.

WILCOX, LOUISE K., and BURKS, GORDON E. *What Is Money?* Illustrated by Betsy Warren. Steck, 1959, 48 pp., $2.00. Grades 4-7.

The origin and development of money, its exchange for goods, and how it is earned, saved, and invested.

"Wise Owl Books." Holt, 1965, $34.95 per set (books not sold individually). Grades 4-6.

A set of twenty books for an individualized supplementary reading program. The following five books relate to mathematics: *Dr. Frick and His Fractions,* by Henry W. Ford; *I've Got Your Number, John,* by Olive S. Berg; *Millions of People,* by Thomas Dripdale and John Dunworth; *Number Patterns Make Sense,* by Howard F. Fehr; and *Optical Illusions,* by Jack and Robert Strimban.

WRIGHT, H. R. *Four Threes Are 12.* See "Young Owl Books," p. 15.

———. *A Maker of Boxes.* See "Young Owl Books," p. 15.

"Young Owl Books." See p. 15.

ZARCHY, HARRY. *Let's Make a Lot of Things.* Knopf, 1948, 156 pp., $3.25. Grades 6-8.

Easy-to-follow step-by-step instructions and clearly drawn diagrams describe the making of earrings, bracelets, rings, masks, and ash trays. An understanding of and ability to apply concepts of measurement are needed.

———. *Let's Make Something.* Knopf, 1941, 158 pp., $3.29. Grades 4-7.

Mathematical concepts are needed to make the objects of wood, clay, plastic, soap, paper, wax, glass, and metal described by Mr. Zarchy.

———. *Wheel of Time.* Illustrated by Rene Martin. Crowell, 1957, 133 pp., $3.50. Grades 6-8.

This book is designed to make the reader aware of the concept of time, its importance in our lives, and devices man has invented to measure it. Amusing clocks and time-keeping devices are described.

ZIM, HERBERT S. *Codes and Secret Writing.* Morrow, 1948, 154 pp., $2.95. Grades 6-8.

Boys will find this introductory book on codes very challenging. One section is devoted to the use of multiplication for devising and breaking codes.

———. *The Sun.* Illustrated by Larry Kettelkamp. Morrow, 1953, unpaged, $2.95. Grades 4-7.

Ideas of number, comparison, size, weight, distance, and temperature are used in this elementary discussion of the sun.

———. *The Universe.* Morrow, 1961, 64 pp., $2.95. Grades 4-6.

Easy-to-read text and pictures about the universe. Helps to develop the idea of use of large numbers and the ideas of comparison, measurement, and the geometry of space.

Junior High School

ABBOTT, E. A. *Flatland*. Dover, 1950, 103 pp., paper, $1.00. Grades 7-8.

This is an imaginative tale that takes the reader into one-dimensional and two-dimensional worlds and into further speculation about dimensions.

ADLER, IRVING. *The Giant Golden Book of Mathematics*. See p. 16.

———. *Inside the Nucleus*. Day, 1963, 191 pp., $4.95. Grades 7-8.

An examination of the composition of atoms, nuclei, and other particles, showing some uses of mathematics.

———. *Logic for Beginners*. Illustrated by Ruth Adler. Day, 1964, 158 pp., $3.95. Grades 7-8.

Examines how to draw a conclusion from what is known and how to arrive at reasons for a known conclusion. Games, jokes, and puzzles are used as illustrations. Brain teasers with answers.

———. *Magic House of Numbers*. See p. 16.

———. *Mathematics: The Story of Numbers, Symbols, and Space*. Illustrated by Lowell Hess. Golden, 1960, 55 pp., $3.95. Grades 7-8.

A brief treatment of such topics as number, symbols, regular polygons, mathematics in nature, mathematics and music, and probability, to show the scope of mathematics.

———. *A New Look at Arithmetic*. Diagrams by Ruth Adler. Day, 1964, 309 pp., $6.95. Grades 7-8.

A reference book on natural numbers, integers, rational numbers, and real numbers. Exercises with answers.

———. *The New Mathematics*. Illustrated by Ruth Adler. Day, 1958, 187 pp., $4.50. Grade 8.

Discussion of our number system as it has grown from the integers used for counting through rational numbers and real numbers to the complex numbers.

———. *Probability and Statistics for Everyman.* Diagrams by Ruth Adler. Day, 1963, 256 pp., $5.95. Grades 7-8.

Discussion of how to understand and use laws of chance. Some pupils with knowledge of algebra can read all of the book; others can read parts.

———. *Thinking Machines.* Illustrated by Ruth Adler. Day, 1961, 189 pp., $4.00. Grades 7-8.

An introduction to the theory of computers for bright junior high school pupils. The ideas range from notions of number to Boolean algebra and logic as these relate to computers.

———. *Time in Your Life.* See p. 16.

———. *The Tools of Science: From Yardstick to Cyclotron.* Illustrated by Ruth Adler. Day, 1958, 128 pp., $3.50. Grades 7-8.

Man measures, analyzes, and changes his universe through instruments that measure, weigh, listen to, break, sift, mix, heat, and freeze things.

ALTERMAN, HYMAN. *Numbers at Work: The Story and Science of Statistics.* Harcourt, 1966, 280 pp., $5.95. Grades 8-9.

A statistics book written by Mr. Alterman for his sons. There are chapters on frequency distributions, averages, probability, sampling, and the uses of computers in statistical work.

ANDERSON, JOHN T., and OGILVY, C. T. *Excursions in Number Theory.* Oxford, 1966, 167 pp., $5.00. Grades 7-8.

Challenging ideas and problems for very bright junior high school pupils who are inquisitive. Considers new uses of number theory and fresh approaches to old problems.

ANDERSON, RAYMOND W. *Romping Through Mathematics.* Illustrated by Harry Zarchy. Knopf, 1947, 152 pp., $3.00. Grades 7-8.

Describes the invention of methods of counting and measuring, with chapters on arithmetic, algebra, geometry, logarithms, probabilities, trigonometry, analytic geometry, and calculus.

ANDREWS, F. EMERSON. *New Numbers.* Harcourt, 1935, 168 pp., $2.00. Out of print. Grades 7-8.

Argument for change from the present decimal number system to a system using twelve as a base.

———. *Numbers, Please.* See page 17.

ANDREWS, W. S., *et al. Magic Squares and Cubes*. Dover, 1960, 419 pp., paper, $1.85. Grades 7-8.

A detailed series of essays on the construction and properties of magic squares, cubes, and figures of other shapes. Many of the less-well-known types are described and analyzed mathematically.

ASIMOV, ISAAC. *Breakthroughs in Science*. Houghton, 1960, 197 pp., $4.00. Grades 7-8.

Brief, terse biographies of people famous for their contribution toward progress in knowledge. Among these are Archimedes, Galileo, Newton, and Einstein.

———. *The Clock We Live On*. Illustrated by John Bradford. Abelard, 1965, 160 pp., $3.50. Grades 7-8.

A comprehensive story of time, reflecting thousands of years of human effort.

———. *An Easy Introduction to the Slide Rule*. Houghton, 1965, 187 pp., $3.50. Grades 7-8.

Explanation of the basic scales on standard slide rules for addition, subtraction, multiplication, and division, as well as more complicated scales such as those for squaring and cubing.

———. *Realm of Measure*. Houghton, 1960, 186 pp., $3.00. Grades 7-8.

Relates the development of measurement from the origin of various units and their standardization and conversion factors to an interesting analysis of the "dimension" of complex units of length, mass, and time.

———. *Realm of Numbers*. Diagrams by Robert Belmore. Houghton, 1959, 200 pp., $3.25. Grades 7-8.

The story of the development of number ideas and of difficulties in symbolizing them. Extends from the concept of ten or less to the concept of infinitely many.

BAKST, AARON. *Mathematical Puzzles and Pastimes*. Van Nostrand, 1954, 206 pp., $5.50. Grades 7-8.

Elementary mathematics presented with a light touch through a large variety of mathematical recreations with solutions.

———. *Mathematics, Its Magic and Mastery*. Van Nostrand, 1952, 790 pp., $8.25. Grades 7-8.

A wealth of material about elementary mathematics is presented with amusing illustrations.

BARNARD, D. ST. P. *A Book of Mathematical and Reasoning Problems: Fifty Brain-Twisters*. See p. 17.

———. *One Hundred Braintwisters*. See p. 17.

BARR, STEPHEN. *Experiments in Topology*. Crowell, 1964, 210 pp., $3.75. Grades 7-8.

Encourages the reader to experiment with the Klein bottle, Moebius strip, projective plane, map coloring, Koenigsberg bridges, and other topological ideas. Written and illustrated in an interesting way.

———. *A Miscellany of Puzzles, Mathematical and Otherwise*. Crowell, 1965, 164 pp., $3.50. Grades 7-8.

A varied and delightful collection of 62 puzzles to be solved by folding or cutting paper; with pencil and paper; with the use of arithmetic, algebra, or geometry; or by common sense. Answers that provide insight into method are included.

BECKHARD, ARTHUR. *Albert Einstein*. Illustrated by Charles Beck. Putnam, 1959, 126 pp., $3.25. Grades 7-8.

The life of the great mathematician-scientist, who played an important part in creating the atomic age, discussed simply and effectively.

BELL, ERIC T. *Men of Mathematics*. Simon, 1937, 592 pp., $6.50. Grades 7-8.

Biographies of men who have invented and influenced mathematics.

BELL, THELMA. *Snow*. See p. 17.

BELL, THELMA, and BELL, CORYDON. *The Riddle of Time*. Viking, 1963, 157 pp., $3.50. Grades 7-8.

An interesting account of many aspects of time, man's grasp of its significance, his efforts to measure it, and, finally, its relation to the theory of relativity.

BENDICK, JEANNE. *Archimedes and the Door of Science*. See p. 17.

———. *How Much and How Many*. See p. 17.

BENDICK, JEANNE, and LEVINE, MARCIA O. *Mathematics Illustrated Dictionary*. See p. 18.

———. *Take Shapes, Lines, and Letters*. See p. 18.

BERGAMINI, DAVID, and the EDITORS OF *Life*. *Mathematics*. Time, 1963, 200 pp., $4.95. Grades 7-8.

Survey of the history of some aspects of mathematics, including its role in art and nature. Chapters are devoted to the calculus, probability and chance, topology, and outstanding mathematicians.

BERRY, ERICK. *Charles Proteus Steinmetz*. See p. 18.

BIXBY, WILLIAM, and DE SANTILLANA, G. *The Universe of Galileo and Newton*. Harper, 1964, 153 pp., $4.95. Grades 7-8.

Biography of two scientists to whom modern scientists are indebted. Mathematics is the basis of their work.

BOEHM, GEORGE A. W., and the EDITORS OF *Fortune*. *The New World of Mathematics*. Dial, 1959, 128 pp., $3.50. Grades 7-8.

Bright children will be interested in this book about the nature of mathematics, computers as mathematical-logical machines, and techniques of modern mathematics.

BOLTON, SARAH. *Famous Men of Science*. Illustrated by Constance Naar. Crowell, 1946, 308 pp., $3.95. Grades 7-8.

Short biographies of men who have contributed to the development of mathematics, including Copernicus, Galileo, Newton, and Einstein.

BOWERS, HENRY, and BOWERS, JOAN E. *Arithmetical Excursions: An Enrichment of Elementary Mathematics*. See p. 18.

BRAGDON, LILLIAN J. *Tell Me the Time, Please*. See p. 19.

BRINDZE, RUTH. *The Story of Our Calendar*. See p. 19.

BROOKE, MAXEY. *150 Puzzles in Crypt-Arithmetic*. See p. 19.

BUFF, MARY, and BUFF, CONRAD. *Big Tree*. See p. 19.

BURLINGAME, ROGER. *Dictator Clock: 5,000 Years of Telling Time*. See p. 19.

CLARK, MARY LOU. *You and Relativity*. Illustrated by Bill Sanders. Childrens, 1965, 61 pp., $2.50. Grades 7-8.

Develops the idea that position, size, speed, and time are relative.

COURT, NATHAN A. *Mathematics in Fun and Earnest*. Dial, 1958, 250 pp., $4.75. Grades 7-8.

Among the essays in this book of interest to superior junior high school mathematics students are "The Vagaries of the Infinite," "Geometrical Magic," "Famous Problems," and "The Might and Plight of Reasoning."

COWAN, HARRISON J. *Time and Its Measurement*. World, 1958, 160 pp $5.95. Grades 7-8.

History of the measurement of time and the development of timepieces.

DAVIS, BARBARA. *Learning Science Through Cooking*. See p. 20.

DEGRAZIA, JOSEPH. *Math Is Fun*. See p. 20.

DELACY, ESTELLE. *Euclid and Geometry*. Watts, 1963, 120 pp., $2.95. Grades 7-8.

A simply written biography of Euclid and a discussion of the first geometry book, Greek geometry after Euclid, and non-Euclidean geometries.

DIGGINS, JULIA E. *String, Straightedge, and Shadow: The Story of Geometry*. See p. 20.

DUDENEY, HENRY E. *Amusements in Mathematics* (rev. ed.). Dover, 1958, 258 pp., paper, $1.25. Grades 7-8.

About four hundred puzzles, problems, paradoxes, and brain teasers, both old and new, classified under such topics as arithmetic, algebra, geometry, and games.

EPSTEIN, BERYL, and EPSTEIN, SAM. *The First Book of Measurement*. See p. 20.

FAHNESTOCK, JAMES D. *Computers and How They Work*. Barnes, 1959, 228 pp., $5.95. Grades 7-8.

Explains in a somewhat simple way what computers do, their language, the arithmetic they use, programming, computer logic circuitry, how men and machines communicate, how computers remember, and two types of computers.

FENTON, CARROLL L., and FENTON, MILDRED A. *Worlds in the Sky*. See p. 20.

FERAVOLO, ROCCO. *Wonders of Mathematics*. See p. 20.

FORSEE, AYLESA. *Albert Einstein: Theoretical Physicist*. Macmillan, 1963, 202 pp., $4.95. Grades 7-8.

The story of the student and adult years of Einstein, emphasizing the dedication with which he sought solutions to scientific problems, the high regard in which the scientific community held him, and, above all, his great humility.

FOWLER, H. WALLER, JR. *Kites*. See p. 21.

FREEMAN, MAE BLACKER. *The Story of Albert Einstein*. See p. 21.

FREEMAN, MAE BLACKER, and FREEMAN, IRA. *Fun with Astronomy*. See p. 21.

———. *Fun with Figures*. See p. 21.

FRIEND, J. NEWTON. *Numbers: Fun and Facts*. Scribner, 1954, 208 pp., $3.50. Grades 7-8.

A collection of mathematical oddities, curiosities, puzzles, and problems.

FROHLICHSTEIN, JACK. *Mathematical Fun, Games and Puzzles*. See p. 21.

GALT, TOM. *Seven Days from Sunday*. See p. 21.

GAMOW, GEORGE, and STERN, MARVIN. *Puzzle-Math*. Viking, 1958, 119 pp., $3.00. Grades 7-8.

A series of mathematical brain twisters in story form.

GARDNER, MARTIN. *Mathematics, Magic, and Mystery*. Dover, 1955, 176 pp., paper, $1.00. Grade 8.

The how and why of mathematical tricks with cards, dice, coins, knots, geometrical vanishing illusions, and of other tricks arising from the application of topology, probability, set theory, and theory of numbers.

———. *Science Puzzlers*. Illustrated by Anthony Ravielli. Viking, 1960, 127 pp., $2.50. Grades 7-8.

Easy experiments, old and new, from which children can learn about science. One section contains 21 mathematical experiments.

———. *The Scientific American Book of Mathematical Puzzles and Diversions*. Simon, 1964, 178 pp., $3.50. Grades 7-8.

A variety of puzzles, games, and problems involving probability, paradoxes, flexagrams, topological curiosities, and magic squares.

GREENHOOD, DAVID. *Mapping*. Illustrated by Ralph Graeter. University of Chicago, 1963, 289 pp., $6.00. Grades 7-8.

An excellent book to help users of maps understand and appreciate them. Numerous applications of arithmetic and geometry used in discussions of distance, direction, projections, and surveying.

GREGOR, ARTHUR S. *A Short History of Science*. Macmillan, 1963, 229 pp., $5.22. Grades 7-8.

Includes history of development of ideas of mathematics—measurement, number, geometry—and of men who contributed to the history of mathematics.

HAAS, VICTOR E. *The Magic Numerals of Ali Khayyan*. See p. 22.

HABER, HEINZ. *Stars, Men, and Atoms*. Golden, 1962, 188 pp., $3.95. Grades 7-8.

The final chapter provides some insight into the geometry of four dimensions as it relates to the question of whether the universe is finite or infinite.

HEAFFORD, PHILIP. *The Math Entertainer*. Emerson, 1959, 176 pp., $3.95. Grades 7-8.

A set of fifty entertaining quizzes with answers.

HEATH, R. V. *Mathemagic*. Dover, 1953, 126 pp., paper, $1.00. Grades 7-8.

A collection of many mathematical tricks, games, and puzzles, with a few examples of magic squares.

HIRSCH, S. CARL. *The Globe for the Space Age*. Illustrated by Burt Silverman. Viking, 1963, 88 pp., $3.75. Grades 7-8.

Describes the globe as the best overall representation of the geographical features of the earth and explores the use of the globe in explaining space relations, time, seasons, and weather.

HOGBEN, LANCELOT. *Mathematics in the Making*. Doubleday, 1960, 320 pp., $9.95. Grades 7-8.

Well-illustrated history of mathematics including counting and measurement, our Hindu heritage, the influence of the Greeks and Orientals, and the development of geometry. Some parts are too advanced for junior high school. Excellent reference.

———. *The Wonderful World of Energy*. Doubleday, 1957, 69 pp., $2.95. Grades 8-9.

The description of man's struggle to harness energy shows the significance of mathematical relationships expressed by formulas.

———. *The Wonderful World of Mathematics*. See p. 22.

HOOPER, ALFRED. *Makers of Mathematics*. Random, 1948, 402 pp., cloth, $3.75. Vintage, 1948, paper. Grades 7-8.

This well-organized story of mathematics from the earliest time through the invention of the calculus is told primarily through brief biographies of the inventors.

HOPWOOD, ROBERT R. *Science Model Making*. See p. 22.

HUNTER, J. A. H. *Fun with Figures*. See p. 22.

———. *More Fun with Figures*. See p. 22.

HUNTER, J. A. H., and MADACHY, JOSEPH S. *Mathematical Diversions*. See p. 22.

IRWIN, KEITH G. *The Romance of Weights and Measures*. Viking, 1960, 144 pp., $3.50. Grades 7-8.

The story of the origins and standardization of various units of measure. Stresses the conflict and adjustment between the decimal and nondecimal systems.

JACKER, CORINNE. *Man, Memory, and Machines*. Macmillan, 1964, 126 pp., $3.95. Grades 7-8.

The story behind cybernetics and the products of its machines. How a computer counts, the kind of logic it uses, and the problems it solves by a simple *yes* or *no*.

JOHNSON, DONOVAN A., and GLENN, WILLIAM H. "Exploring Mathematics on Your Own." See p. 22.

JONES, MADELINE. *The Mysterious Flexagons*. See p. 23.

JUSTER, NORMAN. *The Dot and the Line*. See p. 23.

———. *The Phantom Tollbooth*. See p. 23

KARUSH, WILLIAM. *The Crescent Dictionary of Mathematics*. Macmillan, 1962, 313 pp., $7.50. Grades 7-8.

An inclusive reference of more than 1,000 entries, covering material on simple arithmetic, elementary geometry, and algebra, as well as more advanced topics in mathematics such as probability and statistics, computers, and operations research. Though prepared for secondary school students, part of it will be useful to students in Grades 7 and 8.

KLINE, MORRIS. *Mathematics and the Physical World*. Crowell, 1959, 482 pp., $6.00. Grades 7-8.

The very bright will find this book excellent for reference and for personal study of mathematics and its role in the study of nature. The book ranges from arithmetic through trigonometry, the calculus, and non-Euclidean geometries and shows the simultaneous growth of mathematics and science.

KOHN, BERNICE. *Computers at Your Service*. See p. 23.

KOJIMA, TAKASHI. *The Japanese Abacus: Its Use and Theory*. Tuttle, 1954, 102 pp., paper, $1.25. Grades 7-8.

A brief history of the abacus, its basic principles, and directions for performing the four fundamental arithmetic operations with an abacus, and many examples and diagrams.

KRAITCHIK, MAURICE. *Mathematical Recreations*. Dover, 1953, 330 pp., paper, $1.75. Grades 7-8.

Enrichment material on such topics as magic squares, probability, and chess.

LATHAM, JEAN LEE. *Carry On, Mr. Bowditch*. See p. 23.

———. *Trail Blazer of the Seas*. See p. 23.

LEEMING, JOSEPH. *Fun with Puzzles*. See p. 24.

LEVINGER, ELMA EHRLICH. *Albert Einstein*. Messner, 1949, 174 pp., $3.25. Grades 7-8.

A simply written story of Einstein's life describes his accomplishments in science and mathematics as he sought to find why things are as they are.

LEWIS, ALFRED. *New World of Computers*. See p. 7.

LIEBER, LILLIAN R. *The Education of T. C. Mits*. Illustrated by Hugh G. Lieber. Norton, 1944, 230 pp., $4.50. Grades 7-8.

T. C. Mits is The-Celebrated-Man-in-the-Street. As his education is described in verse, mathematical topics are treated in a manner that makes the story and the mathematics exciting.

———. *Infinity*. Illustrated by Hugh G. Lieber. Holt, 1953, 359 pp., $5.00. Grades 7-8.

Infinity is discussed in an interesting manner in an easy-to-read book.

———. *Non-Euclidean Geometry or the Three Moons of Mathesis*. Illustrated by Hugh G. Lieber. Lieber, 1940, 40 pp., $1.25. Out of print. Grades 7-8.

A readable book concerned with proof and non-Euclidean geometry.

———. *Take a Number: Mathematics for the Two Billion*. Illustrated by Hugh G. Lieber. Ronald, 1946, 221 pp., $3.75. Grades 7-8.

The author very effectively helps the reader make a transfer from the use of arithmetic numbers to algebraic numbers.

LOGSDON, MAYME I. *A Mathematician Explains*. University of Chicago, 1936, 189 pp., $4.00. Grades 7-8.

A description of the mathematics of classical times, indicating the types of problems which led to the development of arithmetic, algebra, geometry, and the calculus, the meaning of these branches in modern life, and their relation to the physical sciences. A good book for students anticipating the study of mathematics in secondary school and college.

LOHBERG, ROLF, and LUTZ, THEO. *Electronic Brains*. Sterling, 1965, 221 pp., $4.95. Grades 7-8.

A simple and entertaining explanation of the basic mathematics and mechanism of programming for electronic computers.

MACAGY, DOUGLAS, and MACAGY, ELIZABETH. *Going for a Walk with a Line*. See p. 8.

MARSHALL, ROY K. *Sundials*. See p. 24.

MENNINGER, K. W. *Mathematics in Your World*. Illustrated by Wolfgang Menninger. Viking, 1962, 291 pp., $5.00. Grades 7-8.

Mathematical ideas explained in simple language with familiar problems and illustrations. The book shows that calculation can be an art; it tells of the power of spatial conception and of symbols; and it shows how a simple question may involve a mathematical problem. Valuable enrichment material.

MERRILL, ARTHUR A. *How Do You Use a Slide Rule?* Dover, 1961, 35 pp., paper, 60c. Grades 7-8.

Ten easy lessons in the use of the slide rule for multiplication and division. Exercises with answers.

MERRILL, HELEN A. *Mathematical Excursions*. Dover, 1957, 145 pp., paper, $1.00. Grades 7-8.

Ninety problems involving such topics as Russian multiplication, multiplication by doubling, magic squares, dyadic systems, facts about 37, and division by zero.

MEYER, JEROME. *Fun with Mathematics* (rev. ed.). Harcourt, 1961, 176 pp., $2.95. Grades 7-8.

A book of recreational mathematical activities. Some of the sections are "Number Giants," "Mathematical Midgets," "How the Romans Multiplied," "Casting Out Nines," "Triangular Numbers," "Making a Date Indicator," "The Circle," and "The Ellipse."

MOORE, PATRICK. *Isaac Newton*. Illustrated by Patricia Cullen. Putnam, 1958, 123 pp., $3.25. Grades 7-8.

A biography that gives major attention to Newton's mathematical and scientific findings.

MOTT-SMITH, GEOFFREY. *Mathematical Puzzles for Beginners and Enthusiasts*. Dover, 1954, 176 pp., paper, $1.00. Grades 7-8.

Puzzles requiring the use of mental arithmetic, plane figures, simple algebra, digits and integers, permutations and combinations, and probability. Solutions included.

MUIR, JANE. *Of Men and Numbers*. Dodd, 1961, 249 pp., $3.50. Grades 7-8.

Brief biographical sketches of twelve great mathematicians, emphasizing their contributions to the development of mathematical thought as well as their human foibles and virtues. Portrayed are Pythagoras, Euclid, Archimedes, Cardano, Descartes, Pascal, Newton, Euler, Gauss, Lobatchevski, Galois, and Cantor.

MURRAY, WILLIAM D., and RIGNEY, FRANCIS J. *Paper Folding for Beginners*. See p. 9.

NEELY, HENRY M. *Triangles: Getting Ready for Trigonometry*. Crowell, 1962, 114 pp., $2.75. Grades 7-8.

The history of the relations of triangles to circles, the common uses of triangles, and the possibilities of greater use through trigonometry.

NEWELL, HOMER E., JR. *Space Book for Young People* (rev. ed.). See p. 25.

NEWMAN, JAMES R. (ed.). *The World of Mathematics*. 4 vols. Simon, 1956, 2,535 pp., cloth, $25.00; paper, $9.95. Grades 7-8.

A small library of the literature of mathematics from A'h-mose' to Albert Einstein. Valuable reference in any junior high school library.

NOURSE, ALAN E. *So You Want to Be a Scientist*. Harper, 1960, 152 pp., $3.50. Grades 7-8.

Describes in a general way the work and desirable personal and educational qualifications of a scientist. Separate chapter on mathematics.

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Discussion of money, its source, use, and influence on everyday living.

PERKINS, WILMA LORD. *Fannie Farmer Junior Cook Book*. See p. 25.

PIPER, ROGER. *The Story of Computers*. Harcourt, 1964, 186 pp., $3.50. Grades 7-8.

An account of the history, potentialities, memories, and mechanisms of computers; the varieties of jobs available; training and skills required for the operators.

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Written for adults who have studied but forgotten beginning algebra, this book contains many problems that will be of interest to children.

RIPLEY, ELIZABETH. *Leonardo da Vinci*. See p. 25.

ROGERS, JAMES T. *The Pantheon Story of Mathematics*. Random, 1966, 124 pp., $4.95. Grades 7-8.

Text and illustrations vividly trace the history of mathematics from finger counting to modern ideas and their uses.

ROMBAUER, IRMA. *Cookbook for Girls and Boys*. Bobbs, 1952, 243 pp., $3.95. Grades 7-8.

Recipes for both simple and elaborate dishes, with concise definitions of terms and procedures. Preparation requires the use of ideas of measurement, fractions, and ratios.

ROSEN, SIDNEY. *Galileo and the Magic Numbers*. Illustrated by Harve Stein. Little, 1958, 212 pp., $3.95. Grades 7-8.

The life of the great mathematician and scientist shows how the question "why?" can produce important results. A description of Galileo's accomplishments and of his problem-solving approach will prove profitable to the reader.

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Mathematics is related to the arts, the stars, microscopic plants, and shells, as well as to other aspects of science and to industry.

SANFORD, VERA. *A Short History of Mathematics*. Houghton, 1930, 402 pp., $6.50. Grades 7-8.

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SAWYER, W. W. *Mathematician's Delight*. Penguin, 1943, 238 pp., paper, 95c. Grades 7-8.

Shows how mathematical reasoning resembles "everyday" reasoning and how mathematical ideas are useful in real life. A humorous spirit in the discussion.

———. *Prelude to Mathematics*. Penguin, 1955, 214 pp., paper, $1.25. Grades 7-8.

Analyzes the most prominent characteristics of mathematicians, such as mental venturesomeness, desire to explore, and interest in pattern, generalization, and unification. Illustrations from arithmetic, algebra, and geometry.

———. *Vision in Elementary Mathematics*. Penguin, 1964, 246 pp., paper, $1.25. Grades 7-8.

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SCRIPTURE, NICHOLAS E. *Fifty Mathematical Puzzles and Oddities*. See p. 26.

SHAW, HAROLD A., and FUGE, KERI. *The Story of Mathematics*. Illustrated by Paul Sellers. St Martin's, 1963, 64 pp., $3.50. Grades 7-8.

The story of mathematics as it developed from the needs of man. Short accounts are given of some early mathematicians and of the mathematics developed by them. Excellent illustrations. Quiz and summary at end of each section.

SMITH, DAVID EUGENE. *History of Mathematics*, Vol. II. Ginn, 1925, 725 pp., $10.00; Dover, 1925, 725 pp., paper. Grades 7-8.

An encyclopedia-type reference book excellent for superior students.

———. *Number Stories of Long Ago*. See p. 26.

SMITH, DAVID EUGENE, and GINSBURG, JEKUTHIEL. *Numbers and Numerals*. See p. 27.

SMITH, GEORGE O. *Mathematics: The Language of Science*. See p. 27.

SOONG, MAYING. *The Art of Chinese Paper Folding*. See p. 27.

SOOTIN, HARRY. *Isaac Newton*. Messner, 1955, 191 pp., $3.25. Grades 7-8.

A science teacher writes of Newton's importance in mathematics and science and of his method of study.

STEINHAUS, H. *Mathematical Snapshots*. Oxford, 1960, 266 pp., $7.50. Grades 7-8.

Discussions and illustrations of some applications of mathematics are included. Models of many of the objects described can be made and studied.

STICKER, HENRY. *How to Calculate Quickly*. Dover, 1956 256 pp., paper, $1.00. Grades 7-8.

Explains methods of arithmetic calculation with little or no use of pencil and paper. Contains many examples and exercises for the student.

STONAKER, FRANCES BENSON. *Famous Mathematicians*. See p. 27.

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Five essays discuss calendar revision, multiplication by use of Napier's Bones, the use of the symbol x for a number, a number large beyond normal comprehension, and the cycles of digits in the decimal expansion of the reciprocals of 7 and 17. Historical background and bibliographies are included, and enrichment activities are suggested.

TANI, YUKIO. *The Magic Calculator: The Way of Abacus*. See p. 27.

TANNENBAUM, BEULAH, and STILLMAN, MYRA. *Isaac Newton: Pioneer of Space Mathematics*. Illustrated by Gustav Schrotter. McGraw, 1959, 128 pp., $3.00. Grades 7-8.

The life, work, and times of Isaac Newton enlivened by anecdotes about him and his contemporaries highlight his mathematical and scientific achievements.

———. *Understanding Maps*. See p. 27.

———. *Understanding Time*. McGraw, 1958, 144 pp., $3.00. Grades 7-8.

As the subtitle, "The Science of Clock and Calendars," indicates, this book explains the telling and recording of time and its historic highlights.

TERRY, LEON. *The Mathmen*. See p. 28.

TURNBULL, HERBERT WESTREN. *The Great Mathematicians*. New York, 1962, 141 pp., $3.50. Grades 7-8.

A history of mathematics told through the lives of the most influential mathematicians from the ancient Egyptians to the early twentieth century.

VALENS, EVANS G. *The Number of Things: Pythagoras, Geometry and Humming Strings*. See p. 28.

VERGARA, WILLIAM C. *Mathematics in Everyday Things*. Harper, 1959, 301 pp., $4.95. Grades 7-8.

Through questions and answers the author relates the principles of mathematics to everyday objects and occurrences. He also discusses some mathematical concepts that are interesting in their own right. Among the questions are "Which rectangle is the most beautiful?" "Is the number 13 unlucky?" "What is the principle behind whispering galleries?" "How fast do meteors travel?"

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Computers from sand tables to electronic brains and their uses are discussed in an interesting way. Sections are included on numeration systems and the binary arithmetic of the digital computer.

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The biography of a rocket engineer who from boyhood was driven by an insatiable curiosity to explore space. His difficulties and successes with mathematics and physics are detailed.

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WILCOX, LOUISE K., and BURKS, GORDON E. *What Is Money?* See p. 28.

WILKINS, H. PERCY, and MOORE, PATRICK. *How to Make and Use a Telescope*. Norton, 1956, 195 pp., $4.75. Grades 7-8.

Instructions for constructing a small telescope and using it to make astronomical observations. Mathematics is needed for construction and use.

WYLIE, C. R. *101 Puzzles in Thought and Logic*. Dover, 1957, unpaged, paper, $1.00. Grades 7-8.

Puzzles in this book require the use of problem-solving methods in nonmathematical situations.

YOSHINO, Y. *The Japanese Abacus Explained*. Dover, 1937, 240 pp., paper, $1.35. Grades 7-8.

A description of how to calculate with the Japanese abacus. With exercises.

ZARCHY, HARRY. *Let's Make a Lot of Things*. See p. 29.

———. *Let's Make Something*. See p. 29.

———. *Wheel of Time*. See p. 29.

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———. *The Sun*. See p. 29.

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